

Sanofi-Aventis Deutschland GmbH

Research & Development, Chemical Development,
Process & Particle Development (P&PD) group
Industriepark Höchst, Frankfurt, Germany

Dr. Martin Philipp Feth
Phone: +49 (0) 69 305 18052
e-mail: MartinPhilipp.Feth@sanofi-aventis.com

Raman test measurements for the new sample holder cover technology for OEB class 5 (Occupational Exposure Band) and electrostatic compounds

a) Raman spectra of mannitol prepared in sample holder for OEB5 substances (with special metal grid cover) measured in the sample chamber of a Raman RXN1-Workstation coupling (Kaiser Optical Systems Ltd.) using a P^hAT probe head (6 mm spot size, 400 mW laser power, 785 nm laser wavelength, 30 s exposure time)

Summary of the results:

- Raman spectra of chemical compounds can be measured through the metal meshwork (refer to Figure 1, Figure 2 and Figure 3).
- The intensity of the detected Raman photons is lower when the compound is measured through the cover (Figure 2). This was an expected observation as the diffuse scattering on the metal grid reduces the overall yield of detected photons.
- No additional Raman signals due to the metal based cover were detected (Figure 3) in the spectrum of the covered sample.
- Slight increase in the diffuse background in the wavenumber range between 100 – 500 cm⁻¹ (Figure 3) was observed in the Raman spectrum of the covered sample. The higher background, however, will not influence the data analysis significantly.



Figure 1: Mannitol prepared in covered sample holder (picture on the left) and Raman measurement of the sample via a RXN1-Workstation coupling (Kaiser Optical Systems Ltd., picture on the right).

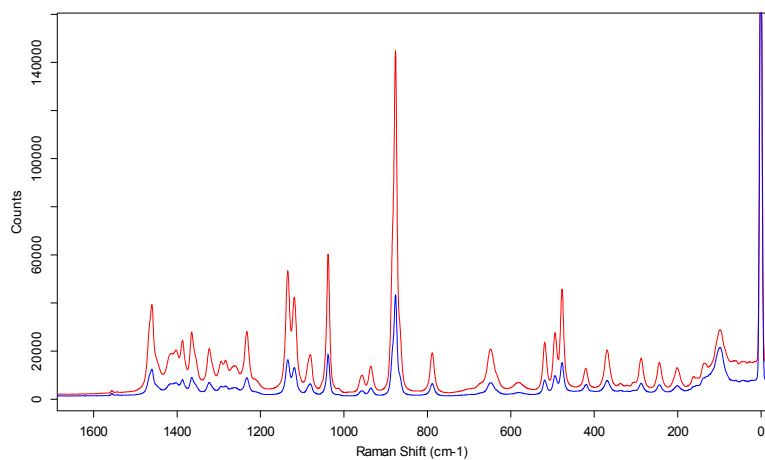


Figure 2: Raman spectra of mannitol: sample holder non-covered (spectrum in red) and sample holder covered (spectrum in blue).

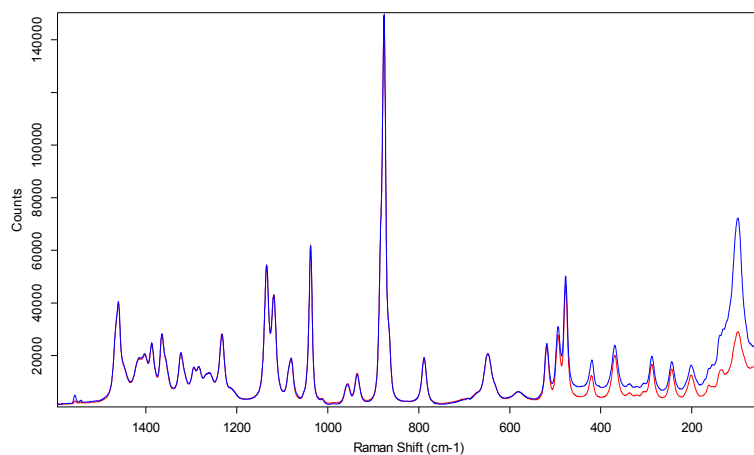


Figure 3: Normalized Raman spectra of mannitol: sample holder non-covered (spectrum in red) and sample holder covered (spectrum in blue).

b) Raman spectra of mannitol prepared in sample holder for OEB5 substances (with special metal grid cover) measured in SPS11-10 μ (Projekt Messtechnik) via a Raman RXN1-Workstation coupling (Kaiser Optical Systems Ltd.) using a P^hAT probe head (6 mm spot size, 400 mW laser power, 785 nm laser wavelength, 30 s exposure time)

Summary of the results:

- Raman spectra of chemical compounds can be measured through the metal meshwork (refer to Figure 4, Figure 5 and Figure 6).
- The intensity of the detected Raman photons is lower when the compound is measured through the cover (Figure 5). This was an expected observation as the diffuse scattering on the metal grid reduces the overall yield of detected photons.
- No additional Raman signals due to the metal based cover were detected (Figure 6) in the spectrum of the covered sample.
- Slight increase in the diffuse background in the wavenumber range between 100 – 500 cm^{-1} (Figure 6) was observed in the Raman spectrum of the covered sample. The higher background, however, will not influence the data analysis significantly.

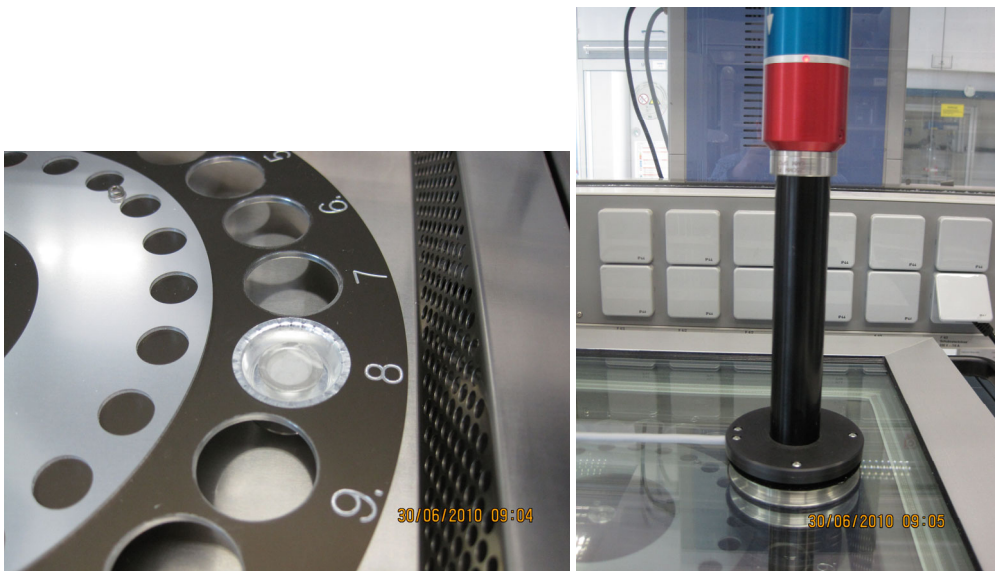


Figure 4: Mannitol prepared in covered sample holder and placed in a SPS11-10 μ machine (on the left) and Raman measurement of the sample via a RXN1-P^hAT probe system (Kaiser Optical Systems Ltd., on the right).

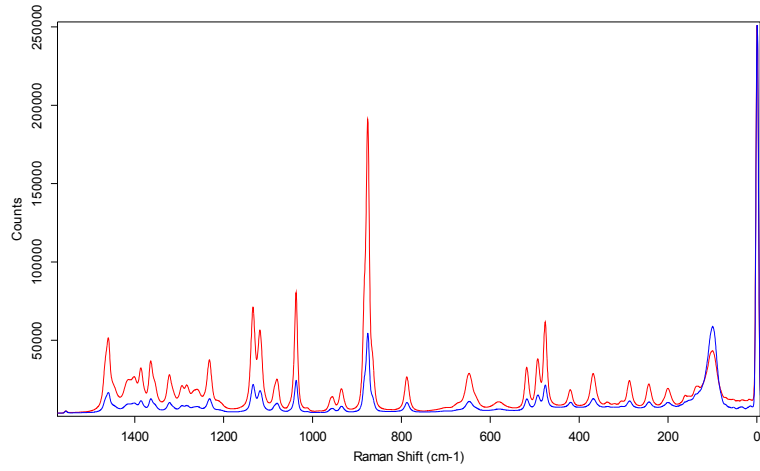


Figure 5: Raman spectra of mannitol: sample holder non-covered (spectrum in red) and sample holder covered (spectrum in blue).

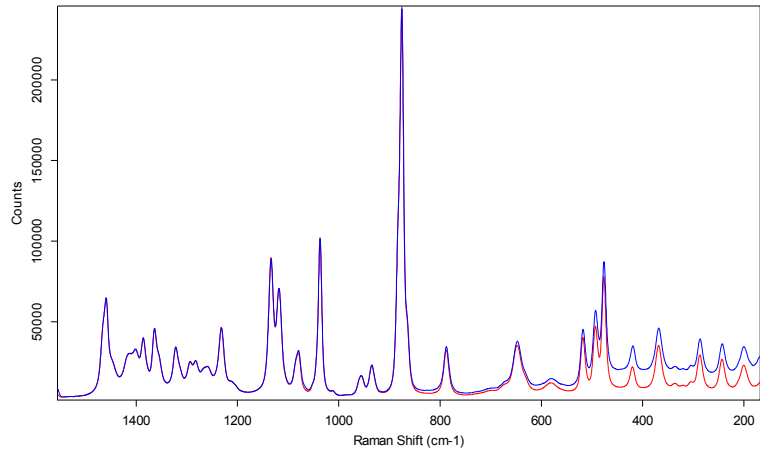


Figure 6: Normalized Raman spectra of mannitol: sample holder non-covered (spectrum in red) and sample holder covered (spectrum in blue).